LYNCHBURG CITY COUNCIL
Agenda Item Summary

MEETING DATE: **April 8, 2003** AGENDA ITEM NO.: 8

CONSENT: **X** REGULAR: CLOSED SESSION: (Confidential)

ACTION: **X** INFORMATION:

ITEM TITLE: **Water Quality Improvement Grant From Virginia Department Of Conservation And Recreation (DCR)**

RECOMMENDATION: Appropriate $100,000 from the Virginia Department of Conservation and Recreation (DCR) for a Water Quality Improvement Grant to update the City's Federal Emergency Management Agency (FEMA) floodplain maps and to develop a watershed computer model.

SUMMARY: In FY 2002 the City applied jointly with Bedford County to the DCR for a Water Quality Improvement Grant as the Blackwater Creek Watershed is located in both Bedford County and the City. Both local governments were awarded $100,000. The grants will be used to update the FEMA floodplain maps and to develop a watershed computer model that can be used by all developers and engineers to better predict watershed impact from new development on downstream properties.

Acceptance of the grant required a 100% local match. The DCR accepted funds previously expended on the Comprehensive Plan update as the match.

A consultant has been selected, AMEC Earth and Environmental, Inc., to develop a regional stormwater management study. This study will provide the foundation for updated digital floodplain mapping and identifying existing and proposed water quality and quantity impacts that are causing erosion and other adverse impacts along watercourses in the City.

PRIOR ACTION(S): January 15, 2002 - Acceptance of Grant

FISCAL IMPACT: None

CONTACT(S): Rachel Flynn – 847-1435 – Ext. 253

ATTACHMENT(S): City Council report – January 15, 2002

REVIEWED BY: lkp

RESOLUTION

BE IT RESOLVED that $100,000 is appropriated to the City/Federal/State Aid Fund, with full reimbursement from the Virginia Department of Conservation and Recreation (DCR), for the Water Quality Improvement Grant to update the Federal Emergency Management Agency (FEMA) floodplain maps and to develop a watershed computer model for use in development projects on downstream properties.

BE IT FURTHER RESOLVED that the Financial Services Director is authorized to make such temporary transfers necessary to fund this grant.

Introduced: Adopted:

Certified: _____
Clerk of Council

077L

LYNCHBURG CITY COUNCIL REPORT

Meeting Date: January 15, 2002 Council Report # 6

Contact: Rachel Flynn (847-1508/253) Report Writer: Rachel Flynn

Subject: Water Quality Improvement Grant from Department of Conservation and Recreation (DCR)

Purpose of Action: Inform Council of $100,000 grant approval by DCR and proposal to use Comprehensive Plan funds as local match

Requested Action: Resolution to approve grant agreement using Comprehensive Plan funds as match.

Funding: N/A

Prior Action: None

Attachments: Grant proposed approved by DCR

Resolution:

BE IT RESOLVED That City Council hereby authorizes the Department of Community Planning & Development to accept the Water Quality Improvement Grant through the Department of Conservation and Recreation and use expenditures for the Comprehensive Plan as the local match.

Adopted:

Certified: _____

Clerk of Council

013L

Other Information:

Last year the Department of Community Planning & Development applied to the Department of Conservation and Recreation for a Water Quality Improvement Grant. We jointly applied with Bedford County because the Blackwater Creek Watershed is located in both Bedford and Lynchburg. Kent White of the Robert E. Lee Soil & Water Conservation District did the lion's share of the grant application (with assistance from Planning and Public Works). We were successful in our application. Both Bedford and Lynchburg have been awarded $100,000 each.

We applied for the grant in order to update our FEMA floodplain maps, which are twenty-five years old. In addition, we will develop a watershed computer model that can be used by all developers/engineers in the future to better predict watershed impact from new development on downstream properties. As you know, the impact of large commercial development is causing erosion on downstream properties (primarily residential). We are hearing increased concerns from citizens whose properties are being affected.

Currently, engineering firms are using outdated FEMA maps for their analyses. In addition, each firm uses its own computer model to determine impact, which we have no way of verifying given staffing and funding limitations. This grant will allow for accurate and consistent analysis – that we will be able to review. In addition, the Environmental Protection Agency (EPA) has new regulations entitled EPA Phase II Storm Water Regulations. These are more stringent and will be imposed on localities within the next two to three years. The information we gain by applying this grant will allow us to be better prepared when the EPA Phase II regulations are imposed.

Like most grants, this one requires a 100% local match. We proposed to them in our application that our match be through funds we are spending on the Comprehensive Plan update. DCR accepted this form of match, given that it involves mapping, engineering, environmental components and land-use impact. **Please know that no additional funds are required if we accept this grant. The funds we are already expending on the Comprehensive Plan can be applied.**

SCOPE OF WORK
Regional Stormwater Management: A Strategy for Responsible Development within City of Lynchburg
City of Lynchburg

I. Project Summary

The Lynchburg City Council has resolved that the lands and waters comprising the watersheds are valuable and important natural resources. Therefore, it has been determined that it is in the public interest to establish requirements to regulate the discharge of stormwater runoff from impervious sites through the development of a stormwater ordinance. In the interest of promoting responsible development and maintaining the quality of the natural watercourses within the region, the City and County, in conjunction with the Peaks of Otter and Robert E. Lee Soil and Water Conservation Districts, propose to develop a regional stormwater management plan. "The development of a regional stormwater management plan . . . [would allow the] . . . local government to strategically locate stormwater facilities to provide the most efficient control of localized flooding, stream channel erosion, and water quality. In addition, a regional plan . . . [would provide] . . . the added benefit of mitigating the impacts of existing development to allow for restoration of urbanized stream systems." (Virginia Stormwater Handbook, p. 2-26) The results of this study, in conjunction with the development of the localities' comprehensive plans, will provide updated land use determinations, recommendations for future development/open land conservation and recommendations for typing/location of stormwater Best Managernent Practices (BMP's). The methodology for the development of this plan will involve modeling the some 60 sub-watersheds based on current, projected and "built out" (ultimate development) conditions. The results of the models will then be evaluated to develop pollution potentials, floodplain elevations and loss projections based on land use. Ultimately, the data from the study will be used to develop strategies to minimize and/or eliminate problems associated with runoff; these strategies will then be incorporated through a review/re-drafting process to provide a stormwater ordinance for each locality.

The watersheds are located within the City of Lynchburg, Virginia, nestled east of the Peaks of Otter within the Blue Ridge Mountains. Half of the proposed project is located within the James River watershed located in the Chesapeake Bay drainage; a tributary strategy has been developed for the Middle James River basin and stormwater management has been prioritized within this basin. The project proposes to address the nonpoint source runoff potentials associated with sediment, nutrients and pathogenic bacteria, as identified within the current and proposed strategies for the respective watersheds through water quality urban BMP's.

The proposed regional stormwater plan targets streams that are currently impaired, listed within the draft 1998 TMDL 303(d) list. The impaired watersheds include HO3 (James River/Blackwater Creek/Ivy Creek), LO4 (Roanoke River/Mason Creek) and L26 (Little Otter/Machine Creek) currently designated as high for urban impairments; HO5 (James River/Beaver Creek/Beck Creek) is designated as medium for urban impaixment (with a high designation for forestry implying future potential development lands). This designation is confirmed in the 1997 Virginia NPS Watershed Assessment Report, detailing H03, LO4 and L26 as having a high ranking, while HO5 has a medium ranking. Finally, monitoring through the Department of Environmental Quality, Randolph-Macon Woman's College, Lynchburg College and Friends of Lynchburg Stream Valleys also identify overall poor water quality and impairments due to fecal coliform loadings.

The proposed regional stormwater strategy will address each impairment by prioritizing land use within the watershed and designating possible sites for best management practices which tackle quality and quantity concerns. The goal will be to eliminate a "cookie cutter" management strategy that has provided "traditional" management. Instead, it will promote more innovative management for addressing impacts to natural watercourses. Ultimately these recommendations will be incorporated into local ordinances providing long-term stormwater management guidelines.

II. Project Coordination

Taking the lead role in the development of the strategy will be the City of Lynchburg Department of Community Planning and Development, directed by Rachel Flynn. Working closely with the city will be Bedford County Community Planning Department and the Peaks of Otter and the Robert E. Lee Soil and Water Conservation Districts who will oversee the day to day administration of the project and coordinate with local, state and federal agencies as applicable. Other groups participating in the project include the Ivy/Blackwater Conservation Coalition and the Central Virginia Watershed Institute, two public-private partnerships that support cooperative prevention of water quality degradation and impairment. These groups are comprised of Lynchburg College, Randolph-Macon Woman's College, Friends of Lynchburg Stream Valleys, Central Virginia Master Gardeners, Lynchburg Area Tree Stewards, Central Virginia Planning District Commission and Lynchburg Division of Parks and Recreation.

The development of the strategy, and ultimately the ordinance, will hinge on the findings of the nonpoint source component of the comprehensive management plan. The proposed regional stormwater plan will be used to enhance this component by prioritizing future development strategies, evaluating the effect of current land use within the jurisdictions and projecting the effect of ultimate "build out" and haphazard development on the natural stream systems within the respective watersheds. Once developed, the regional stormwater plan will then be included within the comprehensive plan for each locality, with recommendations addressed in the development of a stormwater ordinance.

Due to the varying nature of work, the staffing requirements for the project are quite diverse. Using local volunteer support, "in kind" staff hours, and consultant services, technical assistance hours will be used as matching funds for the project. Technical staff for the project will include:

Principal:

Consultant to Bid, Consultants, Regional Stormwater Management Plan

Technical Assistance Partners:

Brent M. Wills, Conservation Specialist, Peaks of Otter SWCD
Kent L. White, Conservation Administrator, Robert E. Lee SWCD
Natural Resource Technicians/Conservationist, NRCS
Lynchburg Watershed Monitors, Field Technicians, Lynchburg College

Planning / Legal Advisory Partners:

Mary Means & Associates, Consultants, Lynchburg Comprehensive Plan
Bedford County Department of Community Development, Staff, Bedford Comprehensive Plan
Lynchburg Community Planning & Development, Staff, Lynchburg GIS Maps
City Attorney's Office, Staff, Ordinance Review
DCR Stormwater Management, Staff, Ordinance Review

III. Water Quality Improvements

The water quality initiatives associated with the plan are based on the identification of land use within the respective watersheds, tailoring innovative best management practices that address more than the mandated quantity concerns. Despite objectives the City of Lynchburg to create a more comprehensive law (including reduction of minimum disturbed acreage requirements to 5000 ft^2 and 1000 ft^2, respectively), the nature of MS-19 demonstrates the inefficiency of "lot by lot" stormwater management, especially with regard to stormwater detention. The City of Lynchburg recognizes the

need for responsible development – that is, development that promotes the vitality of the region while working to maintain natural features of the landscape, quality of the watercourse and to alleviate flooding concerns.

Strategies to reduce current stream impacts vary with the type of land use. The plan will provide the localities with the information necessary to target impairments based on particular developments; for example, sediment concerns can be addressed not only through regional detention but also through retrofits, bioengineering or downstream stabilization methods. Nutrient and toxin reduction is also targeted through quality BMP's, including extended detention for example, designed to receive the "first flush" of runoff that transports most nutrients to natural watercourses. In addition, through implementation of vegetated practices, buffer strips, and land conservation initiatives, as outlined in the comprehensive plan, the localities can again target nutrient reduction. Finally, in conjunction with the city's Combined Sewer Overflow initiative, fecal coliform counts are already being reduced at the cost of additional surface water runoff; the implementation of a regional plan can alleviate concerns through design of stormwater retrofits within the watersheds.

Recommendations for BMPs will be made once the stormwater plan is complete. Individual BMP's will then be based on land use to achieve the maximum quality and quantity benefits, within the sub-watershed. The plan will also target sites for placement of regional BMPs that provide the additional benefit of:

- Increased efficiency for the entire watershed, rather than one small site.
- The ability to control temperature of outflow which is not possible with small facilities.
- Strategic locations within a watershed and designed for coincident stormwater releases, resulting in a coordinated system of controls.
- Strategic locations to control some existing, as well as future, development and compensate for the pre-existing development that does not have adequate (or any) stormwater control to help reduce stream bank erosion and negative impacts of downstream floodplains and wetlands.

BMP Summary Table - Documentation of future nutrient reductions related to adoption of local government stormwater management ordinances:

1. *Document the previous two (2) years disturbed acreage data:*

Hydrologic Unit	1997 Disturbed Acreage	1998 Disturbed Acreage
HO3 (Bedford County)	247 acres	405 acres
HO3 (City of Lynchburg)	145 acres	156 acres
HO5	0 acres	0 acres

2. *Establish a trend from the previous years data to predict future years development which would be regulated by a local stormwater management ordinance.*

The trends in the data indicate a significant increase in disturbed acreage in the HO3 watershed due to services designed to promote economic growth within this areas. More disturbed acreage within HO5 is also projected due to ever-increasing property values, given the proximity to city services of Lynchburg and Roanoke, respectively, as well as nearby recreational and scenic areas. 1999 disturbed acreage values were not available but increases within each watershed are projected.

3. *Establish general fractions of the total anticipated development consisting of commercial, residential and industrial development per established zoning.*

Past estimates of land use data within the City of Lynchburg are considerably inadequate for the basis of anticipating growth. The locality is in the: process of updating the comprehensive plan from the last revised date of 1988 and more accurate values for both current and projected growth will be available prior to the creation of the regional stormwater management plan. Staff members from the City of

Lynchburg Department of Community Planning and Development estimated the acreage based on the most recent zoning maps. However, a comprehensive plan review is needed to evaluate these land uses effectively.

Land use	Bedford County (acres) – H03 – James River WS	City Of Lynchburg (acres) – H03,H05
Commercial	3009	2910
Residential	18,261	18,712
Industrial	1736	3827

Since the current land use data is inadequate to provide reasonable values for these projections, one aspect of the regional stormwater management plan will be to establish general densities based on regional development trends. As determined through the calculations below (based on p. 5-106 and107 of the Stormwater Management Handbook), the total pollutant loading potentials for residential, commercial and industrial development within the targeted watersheds are 15,154 lbs/acre/year for Bedford and 2 1,25 1 lbs/acre/ year for Lyncbburg. The consultant will recommend corresponding stormwater BMP strategies based on ultimate development; reasonable estimates of removal capacities project a reduction of 9,286 lbs/acre/year for Bedford and 9964 lbs/acre/year for Lynchburg – reductions of 45% and 46%, respectively. Given this high pollutant count and the potential for reductions of this caliber, it is necessary to implement a regional stormwater plan in order to initiate an effective stormwater ordinance.

Bedford Countv Actual Land-use Data and General Densitv Percentaees

Residential Zone	Acreage	% General Density	Commer-cial Zone	Acreage	% General Density	Industrial Zone	Acreage	% General Density
AR	9538.37	5%	C-1	278.88	75%	I-2	934.42	90%
R-1	6852.30	15%	C-2	1029.50	80%	PID	74.08	90%
R-2	7297.36	35%	PCD	2629.90	80%		1008.50	
R-3	1.24	40%	NC	.01	75%			
PRD	635.26	45%		3938.29				
RMH	21.90	65%						
	24346.43							

City of Lynchburg Actual Land-use Data and General Density Percentages

Residential Zone	Acreage	% General Density	Commer-cial Zone	Acreage	% General Density	Industrial Zone	Acreage	% General Density
R-C	2028.42	5%	B-1	419.61	75%	I-1	164.45	85%
R-1	9297.65	15%	B-2	35.52	75%	I-2	1537.56	90%
R-2	4654.97	35%	B-3	1181.08	75%	I-3	2124.87	95%
R-3	3246.25	40%	B-4	37.34	80%		3826.88	
R-4	1289.01	45%	B-5	1183.97	80%			
R-5	223.82	65%	B-6	52.17	80%			
	18711.7			2909.69				

Bedford County Pollutant Loadings

Residential Acreage	Pollutant Loads (lb/acre/ yr)	Pollutant Totals (lb/acre/ yr)	Commer- cial Acreage	Pollutant Loads (lb/acre/ yr)	Pollutant Totals (lb/acre/ yr)	Industrial Acreage	Pollutant Loads (lb/acre/ yr)	Pollutant Totals (lb/acre/ yr)
9538.37	0.22	2098.44	278.88	1.65	460.15	934.42	1.96	1831.46
6852.30	0.42	2877.97	1029.50	1.76	1811.92	74.08	1.96	145.20
7297.36	0.83	6056.81	2629.90	1.76	4628.63	1008.50		1976.66
1.24	0.94	1.17	.01	1.65	0.02			
635.26	1.04	660.67	3938.29		6900.72			
21.90	1.45	31.76						
24346.43		6276.82						

Citv of Lvnchbure Pollutant Loadings

Residential Acreage	Pollutant Loads (lb/acre/ yr)	Pollutant Totals (lb/acre/ yr)	Commer- cial Acreage	Pollutant Loads (lb/acre/ yr)	Pollutant Totals (lb/acre/ yr)	Industrial Acreage	Pollutant Loads (lb/acre/y r)	Pollutant Totals (lb/acre/ yr)
2028.42	0.22	446.25	419.61	1.55	650.39	164.45	1.86	139.78
9297.65	0.42	3905.01	35.52	1.55	55.06	1537.56	1.96	1383.80
4654.97	0.83	3863.63	1181.08	1.55	1830.67	2124.87	2.06	2018.63
3246.25	0.94	3051.48	37.34	1.76	65.72	3826.88		3542.21
1289.01	1.04	1340.57	1183.97	1.76	2083.79			
223.82	1.45	324.54	52.17	1.76	91.82			
18711.70		12931.48	2909.69		4777.45			

Bedford County Pollutant Reduction Potentials

Residential Pollutant Totals (lb/acre/yr)	Reduc- tion Efficiency (based on density)	Total Residen- tial Pollutant Removal	Commer- cial Pollutant Totals (lb/acre/ yr)	Reduction Efficiency (based on density)	Total Commer- cial Pollutant Removal	Industrial Pollutant Totals (lb/acre/ yr)	Reduc- tion Efficiency (based on density)	Total Industrial Pollutant Removal
2098.44	0.15	314.77	460.15	0.65	299.10	1831.46	0.65	1190.45
2877.97	0.15	431.70	1811.92	0.65	1177.75	145.20	0.65	94.38
6056.81	0.40	2422.72	4628.63	0.65	3008.61	1976.66		1284.83
1.17	0.50	0.59	0.02	0.65	0.01			
660.67	0.50	330.34	6900.72		4485.47			
31.76	0.50	15.88						
6276.82		3515.91						

City of Lynchburg Pollutant Reduction Potentials

Residential Pollutant Totals (lb/acre/yr)	Reduction Efficiency (based on density)	Total Residential Pollutant Removal	Commercial Pollutant Totals (lb/acre/yr)	Reduction Efficiency (based on density)	Total Commercial Pollutant Removal	Industrial Pollutant Totals (lb/acre/yr)	Reduction Efficiency (based on density)	Total Industrial Pollutant Removal
446.25	0.15	66.94	650.39	0.65	422.76	139.78	0.65	90.86
3905.01	0.15	585.75	55.06	0.65	35.79	1383.80	0.65	899.47
3863.63	0.40	1545.45	1830.67	0.65	1189.94	2018.63	0.65	1312.11
3051.48	0.50	1525.74	65.72	0.65	42.72	3542.21		2302.44
1340.57	0.50	670.29	2083.79	0.65	1354.46			
324.54	0.50	162.27	91.82	0.65	59.68			
12931.48		4556.43	4777.45		3105.34			

PROJECT MILESTONE TABLE – FY 2001

Grant Agreement Number: 91934-01- WQIA-4

Name or Project: Regional Stormwater Management: A Strategy for Responsible Development within City or Lynchburg

Sponsor: City or Lynchburg

Milestone	Responsible Party	Target Completion Date	Actual Completion Date	Notes
1. Project Management				
1.1 Provide DCR with Progress Reports, Project Financial Report and NPS Pollution Data Tracking Form each Quarter.	City of Lynchburg	04/15/02 04/15/03 07/15/02 07/15/03 10/15/02 10/15/03 01/15/03 01/15/04		
1.2 Final Report to DCR	City of Lynchburg	1/30/04 or 30 days after completion of project		
2. Project Implementation				
2.1 Hire Staff	City of Lynchburg	January 2002		• Project set-up • Advertise Project Regionally for Bid • Interview/Hire Contractor
2.2 Coordinate comprehensive plan to obtain stormwater data	City of Lynchburg	April 2002		• Project Initiation • Analyze conditions and trends • Incorporate neighborhood issues • Phase two plans and communications
2.3 Gather base data for modeling	City of Lynchburg	April 2002		• Develop Comprehensive Plan land use information (current conditions) • Create City/County GIS maps {contour/land use features) • Develop geomorphology listing from existing soils information • Survey of existing stormwater problems. • Field shoot critical cross-sections • Create database and initial survey maps of sites • Water quality monitoring

PROJECT MILESTONE TABLE – FY 2001

2.4 Gather Existing Flood Information	Peaks of Otter SWCD Robert E. Lee SWCD Lynchburg College	April 2002		Same as 2.3
2.5 Evaluate existing problems associated with stormwater.	Consultant	January 2003		• Evaluate problems reported on citizen survey. • Identify stormwater "hot spots" and areas of concern identified in model. • Conduct field assessment of watercourses to evaluate stream conditions. • Make recommendations for remediation of existing problems. • Determine BMP ranking criteria (based on quality/quantity concerns) • Create cost/benefit analysis and construction feasibility report. • Prioritize retrofit and remediation projects based on these rankings for existing land use.
2.6 Develop HEC models for ultimate "build out".	Consultant	February 2003		• HEC-1 Model runs for 2, 10, 25, 50, 100 and 500 year floods for "built out" conditions. • Identify stormwater "hot spots" and areas of concern identified in model. • Create cost/benefit analysis report.
2.7 Develop projections based on existing data in comprehensive plan	City of Lynchburg	April 2003		• Develop final recommendations on projected trends • Develop final inventory and analyze trends. (future development)
2.8 Create HEC models based on proposed land use	Consultant	June 2003		• HEC-1 Model runs for 2, 10, 25, 50, 100 and 500 year floods for proposed development. • Identify stormwater "hot spots" and areas of concern identified in model. • Create cost/benefit analysis report. • Rank improvements based on established criteria. • Recommend planning/zoning considerations to address future concerns.
2.9 Prepare Deliverables	Consultant	August 2003		• Provide HEC-1 and HEC-2 Models to Localities • Provide stormwater criteria recommendations based on models. • Assist with integration of revised data into GIS.
2.10 Update Stormwater Ordinance/Strategic Plan to include recommendations	City of Lynchburg	December 2003		• Develop multi-jurisdictional stormwater ordinance City of Lynchburg/Bedford County